INVENTOR: McBride et al
TITLE: MEDICAL TESTING AND METHOD

attorney docket: CARDIOBEAT-1

EXHIBIT 10

Received from < 480 575 1321 > at 8/16/02 7:54:45 PM [Eastern Daylight Time]

CARDIOBEAT DATA CONTENTS
WLW – 2/28/2000

Each data sample may be represented as an 8 bit binary number with a value of 0 to 255 decimal. For the Z0 data (Channel 3) the data is unipolar with a scale of 50/255 Ohms per step. The value in Ohms may be obtained by multiplying the 8 bit unsigned value by .196.

The remaining 3 channels are referenced to approximately ½ scale (128 decimal). The actual reference value is the value obtained when the impedance device is in the CALIBRATE/NULL mode, hereinafter denoted NullValue. In operation, the real world value of the signal may be computed by subtracting NullValue from the signal value and multiplying by the appropriate scale factor. (Subtracting NullValue from the binary number puts the number in a 2s complement, 7 bit plus sign format)

The Scale factors are as follows:

CH0 – ECG: 27.8 microVolts/step. (3.56 mV full scale)
CH1 – dz/dt: -.0156 Ohm/sec./step (-2 Ohm/sec full scale)
CH2 – DZ: .00156 Ohm/step (.2 Ohms full scale)
CH3 – Z0: .196 Ohm/Step (50 Ohms full scale)

Examples:

Assume the CALIBRATE/NULL mode produces a NullValue of 130 on CH0, CH1, and CH2. (In reality the three readings may be slightly different.)

Z0: 25 Ohms will produce a binary number of ~ 128.
128 x .196 = 25.088 (Ohms)
(Var x .196) = ZO

DZ: -.1 Ohms will produce a binary number of ~ 66.
(66 - 130) x .00156 = -.09984 (Ohms)
(Var – Null) x .00156 = DeltaZ

dz/dt: -1 Ohm/sec will produce a binary number of 194.
(194 – 130) x -.0156 = -.9984 (Ohms/sec)
X **(Var – Null) x .0156 = dzdt**
(Var – Null) x -.0156 = dzdt **(Note negative sign on factor)**

ECG: +1 mV peak will produce a binary number of 166.
(166 – 130) x .0278 = 1.0008 (mV)
(Var – Null) x .0278 = ECG

The way I read this I would compute as shown in blue.
Right or Wrong.
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CH0 – ECG

3.56 mV full scale. The ECG data is centered around half scale. That is, the output of the ECG amplifier is biased to 2.5 Volts with no signal present before being input to the A/D converter. With no signal, the binary data transmitted will be approximately 128 decimal (80 Hex). A positive signal on Lead 2 with respect to Lead 3 produces positive data.

CH1 – dz/dt

-2 Ohms/Sec Full Scale. The dz/dt data is centered around half scale. That is, the output of the dz/dt amplifier is biased to 2.5 Volts with no signal present before being input to the A/D converter. With no signal, the binary data transmitted will be approximately 128 decimal (80 Hex). The sense of the signal is inverted – a decreasing impedance produces a positive going signal.

CH2 – DZ

.2 Ohms full scale. The DZ data is centered around half scale. That is, the output of the DZ amplifier is biased to 2.5 Volts with no signal present before being input to the A/D converter. With no signal, the binary data transmitted will be approximately 128 decimal (80 Hex). An impedance greater than Z0 produces positive data (> 128). An impedance less than Z0 produces negative data (<128).

CH3 – Z0

50 Ohms full scale. The Z0 data is zero based. Zero Ohms produces a data value of zero. 25 ohms produces a data value of 128 (80 Hex). 50 Ohms produces a data value of 255. (FF Hex).